**IN THE CLAIMS:**

Please amend the claims as follows:

1. (currently amended) An X-ray tube ~~(10)~~ in which an anode ~~(20)~~ and a cathode ~~(30)~~ are disposed opposite each other in a vacuumized inner space ~~(40)~~, electrons ~~($e^-$)~~ being able to be produced at the cathode ~~(30)~~, being able to be accelerated to the anode ~~(20)~~ by means of impressible high voltage, and X rays ~~($\gamma$)~~ being able to be produced at the anode ~~(20)~~ by means of the electrons ~~($e^-$)~~, the X-ray tube ~~(10)~~ comprising a multiplicity of mutually complementary acceleration modules ~~(41,...,45)~~, each acceleration module ~~(41,...,45)~~ comprising at least one potential-carrying electrode ~~(20/30/423/433/443)~~, a first acceleration module ~~(41)~~ comprising the cathode ~~(30)~~ with electron extraction ~~($e^-$)~~, and a second acceleration module ~~(45)~~ comprising the anode ~~(20)~~ with the X ray generation ~~($\gamma$)~~, wherein the X-ray tube comprises[[:]]

at least one further acceleration module ~~(42,...,44)~~ with a potential-carrying electrode ~~(423/433/443)~~, the acceleration module ~~(42,...,44)~~ for acceleration of electrons ~~($e^-$)~~ being repeatedly connectible in series as often as desired, and the X-ray tube ~~(10)~~ being of modular construction.

2. (currently amended) The X-ray tube ~~(10)~~ according to claim 1, wherein the difference in potential between each two potential-carrying electrodes ~~(20/30/423/433/443)~~ of adjacent acceleration modules ~~(41,...,45)~~ is constant for all acceleration modules ~~(41,...,45)~~, the final energy of the accelerated electrons ~~($e^-$)~~ being a whole-number multiple of the energy of an acceleration module ~~(41,...,45)~~.

3. (currently amended) The X-ray tube ~~(10)~~ according to ~~one of the claims 1 or~~ claim 1, wherein at least one of the acceleration modules ~~(41,...,45)~~ has a reclosable vacuum valve ~~(531)~~ and/or vacuum seals on one side or on two sides.

4. (currently amended)The X-ray tube ~~(10)~~ according to ~~one of the claims 1 to~~ claim 3, wherein the acceleration modules ~~(41,...,45)~~ include a cylindrical ceramic insulator ~~(53)~~.

5. (currently amended) The X-ray tube ~~(10)~~ according to claim 4, wherein the insulating ceramic ~~(53)~~ has a high-ohmic interior coating.

6. (currently amended) The X-ray tube ~~(10)~~ according to ~~one of the claims 4 or~~ claim 5, wherein the ceramic insulator ~~(53)~~ comprises a ridged exterior structure.

7. (currently amended) The X-ray tube ~~(10)~~ according to ~~one of the claims 1 to~~ claim 6, wherein the anode ~~(20)~~ comprises a target for X-ray generation as well as an emission hole ~~(201)~~ for X-radiation.

8. (currently amended) The X-ray tube ~~(10)~~ according to ~~one of the claims 1 to~~ claim 6, wherein the anode ~~(20)~~ includes a transmission anode, the transmission anode closing off the vacuumized inner space ~~(40)~~ toward the outside.

9. (currently amended) The X-ray tube ~~(10)~~ according to ~~one of the claims 1 to~~ claim 7, wherein the electrodes ~~(20/30/423/433/443)~~ of the acceleration modules ~~(41,...,45)~~ include a shield ~~(412,...,415)~~ for suppression of the stray electron flow on the ceramic insulator ~~(51)~~.

10. (currently amended) The X-ray tube ~~(10)~~ according to claim 9, wherein at least one of the electrodes ~~(423/433/443)~~ and/or shields ~~(412,...,415)~~ comprises spherically or conically designed ends for reducing or minimizing the field peak at the respective electrode ~~(423/433/443)~~ and/or shield ~~(412,...,415)~~.

11. (canceled)

12. (canceled)

13. (new) The X-ray tube according to claim 1, wherein at least one of the acceleration modules has a reclosable vacuum valve and/or vacuum seals on one side or on two sides.

14. (new) The X-ray tube according to claim 1, wherein the acceleration modules include a cylindrical ceramic insulator.

15. (new) The X-ray tube according to claim 14, wherein the insulating ceramic has a high-ohmic interior coating.

16. (new) The X-ray tube according to claim 14, wherein the ceramic insulator ~~(53)~~ comprises a ridged exterior structure.

17. (new) The X-ray tube according to claim 1, wherein the anode comprises a target for X-ray generation as well as an emission hole for X-radiation.

18. (new) The X-ray tube according to claim 1, wherein the anode includes a transmission anode, the transmission anode closing off the vacuumized inner space toward the outside.

19. (new) The X-ray tube according to claim 1, wherein the electrodes of the acceleration modules include a shield for suppression of the stray electron flow on the ceramic insulator.

20. (new) The X-ray tube according to claim 19, wherein at least one of the electrodes and/or shields comprises spherically or conically designed ends for reducing or minimizing the field peak at the respective electrode and/or shield.

21. (new) An irradiation system, wherein the irradiation system comprises at least one X-ray tube in which an anode and a cathode are disposed opposite each other in a vacuumized inner space, electrons being able to be produced at the cathode, being able to be accelerated to the anode by means of impressible high voltage, and X rays being able to be produced at the anode by means of the electrons, the X-ray tube comprising a multiplicity of mutually complementary acceleration modules, each acceleration module comprising at least one potential-carrying electrode, a first acceleration module comprising the cathode with electron extraction, and a second acceleration module comprising the anode with the X ray generation, wherein the X-ray tube comprises at least one further acceleration module with a potential-carrying electrode, the acceleration module for acceleration of electrons being repeatedly connectible in series as often as desired, and the X-ray tube being of modular construction, said at least one X-ray tube having a high voltage cascade for voltage supply of the X-ray tube.

22. (new) A method of production of an X-ray tube in which an anode and a cathode are disposed opposite each other in a vacuumized inner space, electrons being able to be produced at the cathode, being able to be accelerated to the anode by means of impressible high voltage, and X rays being able to be produced at the anode by means of

the electrons, the X-ray tube comprising a multiplicity of mutually complementary acceleration modules, each acceleration module comprising at least one potential-carrying electrode, a first acceleration module comprising the cathode with electron extraction, and a second acceleration module comprising the anode with the X ray generation, wherein the X-ray tube comprises at least one further acceleration module with a potential-carrying electrode, the acceleration module for acceleration of electrons being repeatedly connectible in series as often as desired, and the X-ray tube being of modular construction; wherein:

the X-ray tube (10) is produced in a one-step vacuum soldering process.